CLAIM AMENDMENTS

Claim Amendment Summary

Claims pending

- At time of the Action: Claims 1-35, 37-40, and 42-52.

- After this Response: Claims 1-35, 37-40, and 42-56.

Canceled or Withdrawn claims: none.

Amended claims: 1-6, 13, 19-24, 27, 28, 30, 37, 42-45, and 46-52.

New claims: 53-56.

Claims:

1.   (CURRENTLY AMENDED) A method for measuring bandwidth between two entities on a <u>dynamic</u> network, the method comprising:

<u>via a dynamic network,</u> receiving at least ~~one first~~ <u>a pair of</u> non-compressible ~~packet~~ <u>packets</u> having measurable characteristics<u>, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network</u>;

calculating bandwidth based upon~~, at least partially,~~ <u>measurable</u> characteristics of <u>at least</u> the ~~first~~ <u>pair of</u> non-compressible ~~packet~~ <u>packets</u>.

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2.   (CURRENTLY AMENDED) A method as recited in claim 1, wherein ~~the first~~ each of the pair of non-compressible ~~packet~~ packets is approximately fragmentation-avoidance size.

3.   (CURRENTLY AMENDED) A method as recited in claim 1, wherein ~~the first~~ each of the pair of non-compressible ~~packet~~ packets is highly entropic.

4.   (CURRENTLY AMENDED) A method as recited in claim 1, wherein t ~~the first~~ each of the pair of non-compressible ~~packet~~ packets is formatted for TCP.

5.   (CURRENTLY AMENDED) A method as recited in claim 1, wherein ~~the first~~ each of the pair of non-compressible ~~packet~~ packets is formatted for UDP.

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6. (CURRENTLY AMENDED) A method as recited in claim 1, wherein ~~further comprising~~:

~~after receiving the first packet, receiving~~ a second received packet of the pair non-compressible packet having measurable characteristics including a packet size (PS) and a time of receipt (t_3);

~~wherein~~ the measurable characteristics of ~~the~~ a first received packet include a packet size, which is equivalent to the packet size of the second received packet, and a time of receipt (t_1);

~~wherein~~ a bandwidth (bw) is calculated, during the calculating, by this formula:

$$bw = \frac{PS}{t_3 - t_1}$$

7. (ORIGINAL) A method as recited in claim 1 further comprising querying a modem of an entity about a bandwidth setting of the modem when result of calculating bandwidth is outside a given range of believability.

8. (ORIGINAL) A method as recited in claim 1 further comprising storing result of calculating bandwidth within a list of recent bandwidth measurements.

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9. (ORIGINAL) A method as recited in claim 1 further comprising:

storing result of calculating bandwidth within a list of recent bandwidth measurements;

finding a statistical derivation from such list, such derivation representing a most likely actual bandwidth between the two entities.

10. (ORIGINAL) A method as recited in claim 1 further comprising:

storing result of calculating bandwidth within a list of recent bandwidth measurements;

finding a median of such list, such median representing a most likely actual bandwidth between the two entities.

11. (ORIGINAL) A program module having computer-executable instructions that, when executed within a computing operating environment at an application layer, performs the method as recited in claim 1.

12. (ORIGINAL) A computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 1.

13. (CURRENTLY AMENDED) A method for measuring bandwidth between two entities on a <u>dynamic</u> network, the method comprising:

<u>via a dynamic network,</u> receiving a first non-compressible packet <u>and a second non-compressible packet, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network</u>;

~~receiving a second non-compressible packet;~~

calculating bandwidth based upon <u>the relative timing of the receiving of</u> the first and second non-compressible packets.

14. (PREVIOUSLY PRESENTED) A method as recited in claim 13, wherein bandwidth (bw) is calculated, during the calculating, by this formula:

$$bw = \frac{PS}{t_3 - t_1}$$

where

- PS is packet size of the first and second non-compressible packet;
- t_3 is a time of receipt of the second packet;
- t_1 is a time of receipt of the first packet.

15. (ORIGINAL) A method as recited in claim 13, wherein the first and second non-compressible packets are approximately fragmentation-avoidance size.

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16. (ORIGINAL) A method as recited in claim 13, wherein the first and second non-compressible packets are highly entropic.

17. (ORIGINAL) A method as recited in claim 13, wherein the first and second non-compressible packets are formatted for TCP.

18. (ORIGINAL) A method as recited in claim 13, wherein the first and second non-compressible packets are formatted for UDP.

19. (CURRENTLY AMENDED) A method for measuring bandwidth between two entities on a <u>dynamic</u> network, the method comprising:

via a dynamic network, sending at least ~~one first~~ <u>a pair of</u> non-compressible ~~packet~~ <u>packets, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network</u>;

receiving a bandwidth calculation based upon~~, at least partially,~~ measurements related to <u>at least</u> the ~~first~~ <u>pair of</u> non-compressible ~~packet~~ <u>packets</u>.

20. (CURRENTLY AMENDED) A method as recited in claim 19, wherein ~~the first~~ <u>each of the pair of</u> non-compressible ~~packet~~ <u>packets</u> is approximately fragmentation-avoidance size.

21. (CURRENTLY AMENDED) A method as recited in claim 19, wherein ~~the first~~ each of the pair of non-compressible ~~packet~~ packets is highly entropic.

22. (CURRENTLY AMENDED) A method as recited in claim 19, wherein ~~the first~~ each of the pair of non-compressible ~~packet~~ packets is formatted for TCP.

23. (CURRENTLY AMENDED) A method as recited in claim 19, wherein ~~the first~~ each of the pair of non-compressible ~~packet~~ packets is formatted for UDP.

24. (CURRENTLY AMENDED) A method as recited in claim 19 ~~further comprising sending a second non-compressible packet immediately after sending the first packet and before receiving a bandwidth calculation~~, wherein the ~~first and second~~ packets of the pair are equivalent in size.

25. (ORIGINAL) A method as recited in claim 19, after the receiving, further comprising:

selecting a file formatted for a given bandwidth that is equal to or less than the bandwidth calculation;

sending such file.

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26. (ORIGINAL) A method as recited in claim 19, after the receiving, further comprising:

selecting a subfile formatted for a given bandwidth that is equal to or less than the bandwidth calculation;

sending such subfile.

27. (CURRENTLY AMENDED) A method as recited in claim 19, before the sending, further comprising selecting ~~the first~~ one of the pair of non-compressible ~~packet~~ packets from a set of differing non-compressible packets.

28. (CURRENTLY AMENDED) A method as recited in claim 19, before the sending, further comprising generating ~~the first~~ the pair of non-compressible ~~packet~~ packets.

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29. (ORIGINAL) A computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 19.

30. (CURRENTLY AMENDED) A method for measuring bandwidth between two entities on a <u>dynamic</u> network, the method comprising:

<u>via a dynamic network,</u> sending a first non-compressible packet<u>, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network</u>;

<u>via the dynamic network,</u> sending a second non-compressible packet immediately after the sending of the first packet.

31. (ORIGINAL) A method as recited in claim 30 further comprising receiving a bandwidth calculation based upon measurements related to the first and second non-compressible packets.

32. (ORIGINAL) A method as recited in claim 30, wherein the first and second non-compressible packets are approximately fragmentation-avoidance size.

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33. (ORIGINAL) A method as recited in claim 30, wherein the first and second non-compressible packets are highly entropic.

34. (ORIGINAL) A method as recited in claim 30, wherein the first and second non-compressible packets are formatted for TCP.

35. (ORIGINAL) A method as recited in claim 30, wherein the first and second non-compressible packets are formatted for UDP.

36. (CANCELED)

37. (CURRENTLY AMENDED) A method of approximating a bandwidth between two entities on a network, the method comprising:

generating a list of entries, each entry containing a recent bandwidth measurement;

each measurement being based upon a Packet-Pair bandwidth calculation of different pairs of packets, wherein a pair of packets differs from another pair of packets in objectively measurable characteristics.

38. (ORIGINAL) A method as recited in claim 37 further comprising replacing a measurement in an entry with a most recently calculated measurement.

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39. (ORIGINAL) A method as recited in claim 37, wherein the packets, which are the basis for the Packet-Pair bandwidth calculation, are non-compressible.

40. (ORIGINAL) A method as recited in claim 37, wherein the packets, which are the basis for the Packet-Pair bandwidth calculation, are highly entropic.

41. (CANCELED)

42. (CURRENTLY AMENDED) A computer-readable medium having stored thereon a data structure, comprising:

a list of entries, each entry being a recent bandwidth measurements;

each entry being based upon a Packet-Pair bandwidth calculation of different pairs of packets, wherein a pair of packets differs from another pair of packets in objectively measurable characteristics.

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43. (CURRENTLY AMENDED) A computer-readable medium having computer-executable instructions that, when executed by a computer, perform a method to measure bandwidth between two entities on a dynamic network, the method comprising:

via a dynamic network, receiving a first non-compressible packet and a second non-compressible packet, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network;

~~receiving a second non-compressible packet;~~

calculating bandwidth based upon the relative timing of the receiving of the first and second non-compressible packets.

44. (CURRENTLY AMENDED) A computer-readable medium having computer-executable instructions that, when executed by a computer, perform a method to measure bandwidth between two entities on a dynamic network, the method comprising:

via a dynamic network, sending a first non-compressible packet, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network;

via the dynamic network, sending a second non-compressible packet immediately after the sending of the first packet.

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45. (CURRENTLY AMENDED) A computer-readable medium having computer-executable instructions that, when executed by a computer, perform a method to approximate a bandwidth between two entities on a network, the method comprising:

generating a list of entries, each entry containing a recent bandwidth measurement;

each measurement being based upon a Packet-Pair bandwidth calculation of different pairs of packets, wherein a pair of packets differs from another pair of packets in objectively measurable characteristics.

46. (CURRENTLY AMENDED) A modulated data signal having data fields encoded thereon transmitted over a dynamic communications channel, comprising:

a first packet containing non-compressible data;

a second packet following the first packet, the second packet containing non-compressible data,

wherein a dynamic communications channel being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network.

47. (CURRENTLY AMENDED) The modulated ~~data signals~~ data signal as recited in claim 46, wherein the first and second packets are approximately fragmentation-avoidance size.

48. (CURRENTLY AMENDED) The modulated ~~data signals~~ data signal as recited in claim 46, wherein the first and second packets are highly entropic.

49. (CURRENTLY AMENDED) The modulated ~~data signals~~ data signal as recited in claim 46, wherein the first and second packets are formatted for TCP.

50. (CURRENTLY AMENDED) The modulated ~~data signals~~ data signal as recited in claim 46, wherein the first and second packets are formatted for UDP.

51. (CURRENTLY AMENDED) An apparatus comprising:

a processor;

a network interface configured to be linked to a dynamic network, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network;

a bandwidth measurer executable on the processor to:

receive a first non-compressible packet via the network interface linked to a dynamic network, the first non-compressible packet having measurable characteristics;

receive a second non-compressible packet via the network interface linked to a dynamic network, the second non-compressible packet having measurable characteristics;

calculate bandwidth based upon measurable characteristics of the first and second non-compressible packets.

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52. (CURRENTLY AMENDED) An apparatus comprising:

a processor;

a network interface configured to be linked to a dynamic network, the dynamic network being a communications network having no assurance that both packets of a pair of identical packets are handled in an identical manner while in transit on the communications network;

a bandwidth measurer executable on the processor to:

~~sending a first non-compressible packet;~~

~~sending a second non-compressible packet immediately following the sending of the first packet.~~

send a first non-compressible via the network interface linked to a dynamic network;

via the network interface linked to the dynamic network, send a second non-compressible packet immediately after the first packet is sent.

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53. (NEW) A method as recited in claim 1, wherein the dynamic network is the Internet.

54. (NEW) A method as recited in claim 13, wherein the dynamic network is the Internet.

55. (NEW) A method as recited in claim 19, wherein the dynamic network is the Internet.

56. (NEW) A method as recited in claim 30, wherein the dynamic network is the Internet.

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